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Established to promote excellence in research and teaching. To enhance student and staff experience within our universities and to set the agenda for higher education.

Policy Report
January 2010

Analysis of postgraduate provision at UK Universities

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The 1994 Group

- > The 1994 Group is established to promote excellence in university research and teaching. It represents 19 of the UK's leading research-intensive, student focused universities. Around half of the top 20 universities in UK national league tables are members of the group.
- > Each member institution delivers an extremely high standard of education, demonstrating excellence in research, teaching and academic support, and provide learning in a research-rich community.
- > 1994 Group Universities achieved outstanding results in the Research Assessment Exercise (RAE) 2008. 1994 Group members are UK leaders in seventeen major subject areas, achieving 1st place in their field. 57% of the 1994 Group's research is rated 4* world-leading or 3* internationally excellent.
- > The 1994 Group represents: University of Bath, Birkbeck University of London, Durham University, University of East Anglia, University of Essex, University of Exeter, Goldsmiths University of London, Institute of Education University of London, Royal Holloway University of London, Lancaster University, University of Leicester, Loughborough University, Queen Mary University of London, University of Reading, University of St Andrews, School of Oriental and African Studies, University of Surrey, University of Sussex, University of York.

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Analysis of postgraduate provision at UK Universities

This is a report by Tom Norton on behalf of the 1994 Group's
Research & Enterprise Policy Group

Executive Summary

Introduction

In July 2009, Lord Mandelson announced a review of postgraduate provision in the UK, to be led by Professor Adrian Smith, Director General of Science and Research at BIS. As an initial contribution to this Review, the 1994 Group has undertaken an analysis of postgraduate profiles at the four main university mission groups in the UK.

Using data from RAE 2008 submissions and from the Higher Education Statistics Agency (HESA), we have investigated the volume of postgraduate research students (PGRs) and postgraduate taught students (PGTs) by institution and also by discipline for each of the four main university mission groups (1994 Group, Russell Group, University Alliance and Million Plus). We have also investigated how productive these institutions are in their postgraduate provision and how this productivity spreads across different subject areas.

Conclusions

The conclusions emerging from this analysis are as follows:

- (i) It is the research-intensive institutions of the 1994 and Russell Groups that show the greatest productivity of PhDs, in terms of their completion rates and the relationship between completions and number of academic staff. Our ranked order of productivity rates shows that there is a large drop in productivity between research-intensive universities and the rest of the sector. After Oxbridge, the productivity of the 1994 and Russell Groups in each subject area are very similar, and are particularly high in engineering, physical sciences and natural sciences.
- (ii) The 1994 and Russell Groups are clearly dominant in the sector in terms of the volume of PhDs produced, and this is the case across the subject areas. It is the quality of infrastructure around research teams that seems to be the important factor in producing PhDs, and if a critical mass is to be recommended in postgraduate research provision then it clearly lies within these groups' institutions.
- (iii) There are three levels of the market in PhD provision. Oxford and Cambridge have an extremely strong and unique profile. The institutions of the 1994 Group and the rest of the Russell Group are very strong and productive. Non research-intensive universities of the other mission groups show far less productivity and volume of PhDs.
- (iv) A new quality threshold on PhD provision must be introduced. HEFCE's funding should be more concentrated than it currently is, in order for the

Government's funding to be channelled as effectively as possible and at the best value. This would still allow all institutions to provide PhDs if they wish, but provision below the quality threshold would be reliant on fee income rather than Government funds.

- (v) Volume of PGT provision is more reflective of the overall size of an institution, rather than its research-intensity. PGT provision is spread much more evenly across the sector, reflecting the wide variety of courses in terms of their objectives and the markets for which they are designed.
- (vi) PGT provision is a mass market activity and should be supported at all universities. It is extremely welcome that PGT has been included in the terms of reference for the Review of HE Funding & Student Finance. A particularly key area is widening participation and whether there are barriers to entry at this level.

1. Introduction

- 1.1 In July 2009, Lord Mandelson announced a review of postgraduate provision in the UK, to be led by Professor Adrian Smith, Director General of Science and Research at BIS. As an initial contribution to this Review, the 1994 Group has undertaken an analysis of postgraduate profiles at the four main university mission groups in the UK.
- 1.2 Using data from RAE 2008 submissions and data from the Higher Education Statistics Agency (HESA), we have investigated the volume of postgraduate research students (PGRs) and postgraduate taught students (PGTs) by institution and also by discipline for each of the four main university mission groups (1994 Group, Russell Group, University Alliance and Million Plus).
- 1.3 We have also investigated a selection of proxies for indicating how productive institutions are in their postgraduate provision (for example, looking at how the number of doctoral completions compares to the volume of academic staff likely to be working with them), and how this productivity spreads across different subject areas.
- 1.4 Where we have aggregated the mission groups' institutions we have separated Oxford and Cambridge (Oxbridge) from the Russell Group, because (as the analysis shows) their postgraduate profiles are unique in comparison to other research-intensive universities.

2. PhD productivity and volume by institution

- 2.1 First of all, we believe it is important to provide an overview of the sector, showing the relative productivity and volume of doctoral students at the different universities in the main university mission groups.
- 2.2 To compare how productive each university is, in terms of their doctoral completions, we have used a 'productivity' indicator. This compares the annual doctoral completions at a university to the number of staff most closely aligned to working with research students (those with 'teaching and research' in their employment contracts). Using this measure we have produced a ranked order of PhD productivity rates, the top section of which is shown as Figure 1.

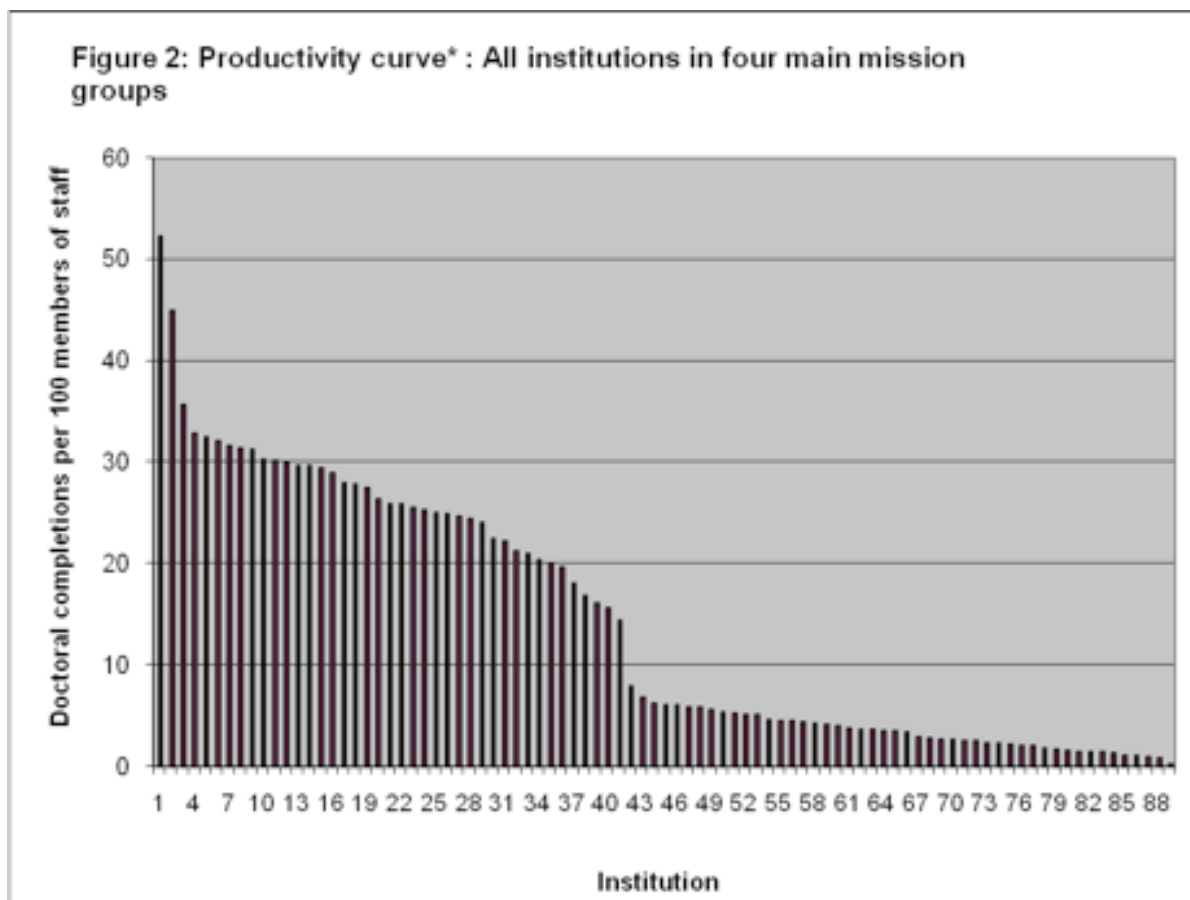
Figure 1. Ranked order of PhD productivity rates
Annual doctoral completions per 100 members of staff

	Institution	PhD Productivity Indicator*
1	University of Cambridge	52.3
2	University of Oxford	45.0
3	Imperial College	35.7
4	University of Surrey	32.8
5	University of Sussex	32.5
6	University of East Anglia	32.1
7	School of Oriental and African Studies	31.7
8	University College London	31.4
9	University of Nottingham	31.3
10	University of Manchester	30.3
11	University of Southampton	30.2
12	University of York	29.9
13	University of Essex	29.7
14	University of Sheffield	29.7
15	University of Bristol	29.4
16	Loughborough University	29.0
17	University of Leeds	28.0
18	University of Reading	27.9
19	London School of Economics	27.5
20	Durham University	26.4
21	University of Newcastle	26.0
22	Institute of Education	25.9
23	University of Warwick	25.5
24	University of Birmingham	25.3
25	University of Bath	25.0
26	University of Edinburgh	24.9
27	Lancaster University	24.7
28	University of Leicester	24.5
29	Queen's University of Belfast	24.1
30	University of Glasgow	22.4
31	University of St Andrews	22.3
32	King's College London	21.2
33	University of Liverpool	21.0
34	Royal Holloway, University of London	20.4
35	University of Exeter	20.1
36	Cardiff University	19.7
37	Aberystwyth University	18.0
38	University of Bradford	16.8
39	Goldsmiths, University of London	16.2
40	Queen Mary, University of London	15.6
41	Birkbeck, University of London	14.4
		(Cut off = 10)

Key
1994 Group
Russell Group
University Alliance

*Doctoral completions (annual average, 2001-2007) by academic staff with 'T&R' employment contracts (annual average, 2004/05-2007/08). Source: RAE 2008 (RA3a); HESA

- 2.3 As we can see from Figure 1, the research-intensive universities of the 1994 and Russell Group are by far the most productive in the sector in terms of their doctoral completions per 100 members of staff, all members of each group being higher than the cut-off point of 10. The top twenty places in the table are shared roughly equally between the two groups, as are the top forty places. The only members of the University Alliance above the cut-off point are Aberystwyth and Bradford. No members of Million Plus are higher than the cut-off point.
- 2.4 This cut-off point is demonstrated more starkly in Figure 2, which uses the same productivity indicator to show the curve across all institutions in the four mission groups.

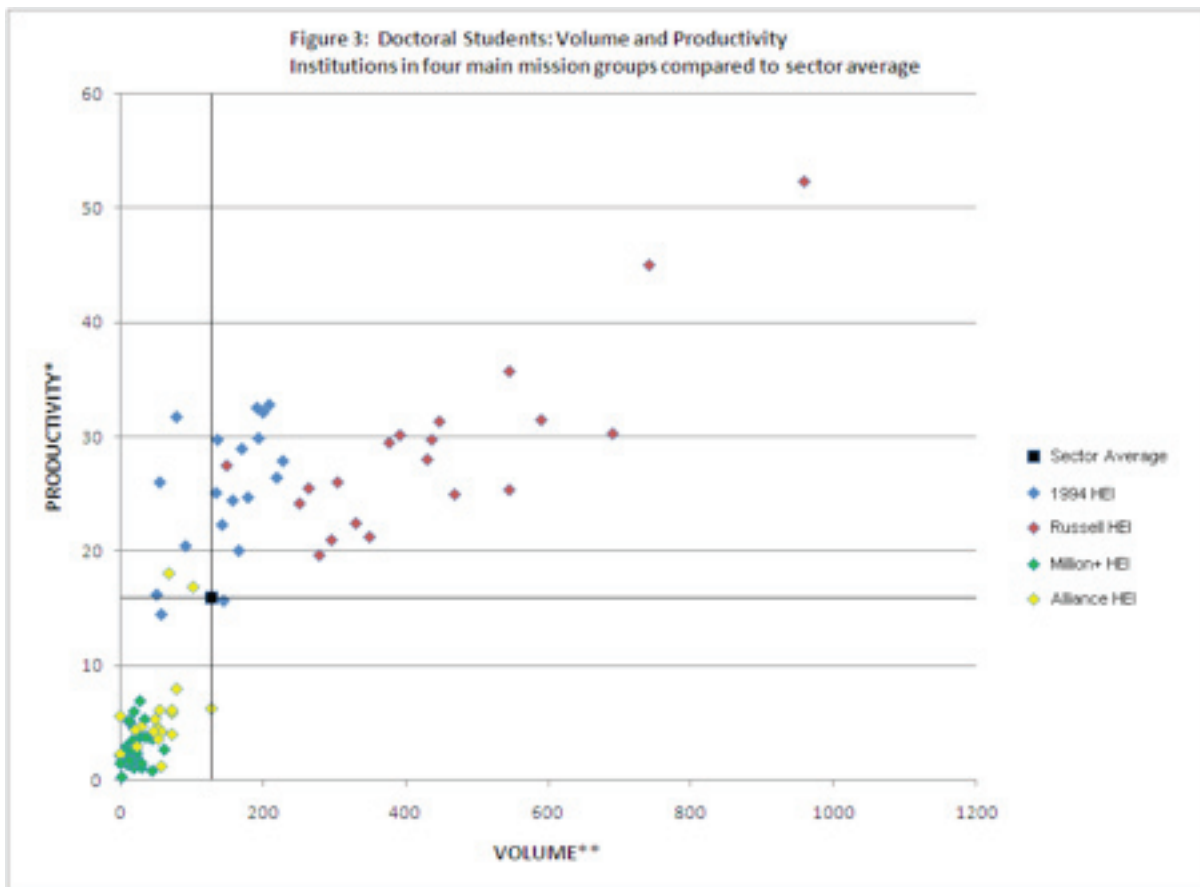


*Doctoral completions (annual average, 2001-2007) by academic staff with 'T&R' employment contracts (annual average, 2004/05-2007/08). Source: RAE 2008 (RA3a); HESA

- 2.5 We can see that between institution 41 and 42 there is a sharp drop in doctoral productivity. All members of the 1994 and Russell Groups have a productivity which is above this drop-off point, strongly suggesting that the research-intensive universities in the sector are the most effective at producing doctoral students and seeing them through to completion. The most productive (institutions 1 and 2 in the chart) are Cambridge and Oxford, after which the level of productivity is spread evenly amongst 1994 and Russell Group members until the drop-off point.¹

¹ Along with two University Alliance members (institutions 37 and 38)

2.6 Figure 3 is a scatter graph showing the distribution of universities in the four major mission groups on a scale indicating their volume of postgraduate students along with their productivity (the number completing as compared to the number of research staff). The intersecting lines drawn on the graph show the sector averages for volume (vertical) and productivity (horizontal).



* Productivity Indicator: Annual doctoral completions (annual average taken from years 2001-2007) (source: RAE 2008 data) per 100 academic staff on 'teaching & research' employment contracts (annual average taken from academic years 2004/05-2007/08) (source: HESA)

** Volume Indicator: PhD graduations (annual average, 2002-06) (source: Evidence UK Research 2007 Yearbook. Cited in P Wellings, 'Intellectual Property and Research Benefits', 30 Sep 2008)

2.7 All institutions that are above average for volume (those to the right of the vertical line) are members of the 1994 and Russell Groups. Due to being larger-scale universities, those showing most volume are members of the Russell Group, and the two institutions showing by far the highest volume are Cambridge and Oxford. The 1994 Group members on the whole show much higher volume of PhD graduations than the members of the University Alliance and Million Plus, despite being in general smaller-scale institutions than the members of these groups. Even the most specialist institutions of the 1994 Group achieve a higher volume of graduations than the majority of Alliance and Million Plus members.

2.8 This chart demonstrates again the similar levels of productivity between 1994 and Russell Group institutions (all, with the exception of Oxbridge, being plotted roughly equally on the y axis), and the significant drop to most of the members of the other two mission groups, almost all of which are clustered in the bottom left-hand corner of the chart.

2.9 It is suggested by this chart that in terms of numbers of PhD graduations, and the effectiveness of producing them in relation to staff numbers, that volume and productivity are strongest in the research-intensive part of the sector.

3. Postgraduate provision by subject area

3.1 This section analyses the volume and productivity of postgraduate provision at each mission group across different subject areas. The eight subject areas we have used are based on the RAE panels, and are categorised as follows:

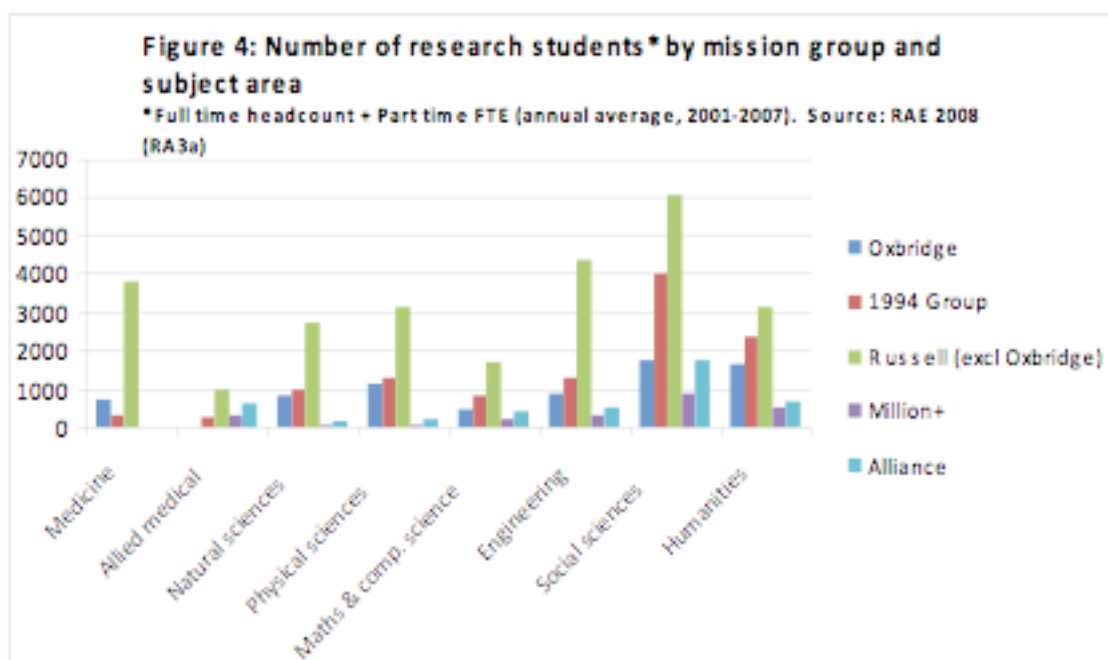
- Medicine (RAE panels A-B)
- Allied medical professions (C)
- Natural Sciences (D)
- Physical Sciences (E)
- Maths & Computer Science (F)
- Engineering (G)
- Social Sciences (H-K)
- Humanities (L-O)

Note: Where HESA data is used in this section, we have aligned the HESA cost centres with the RAE panels. Appendix A shows how we have done this.

Note: When aggregating the mission groups' institutions in this section we have separated Oxford and Cambridge (Oxbridge) from the Russell Group, because (as the analysis shows) their postgraduate profiles are unique in comparison to other research-intensive universities.

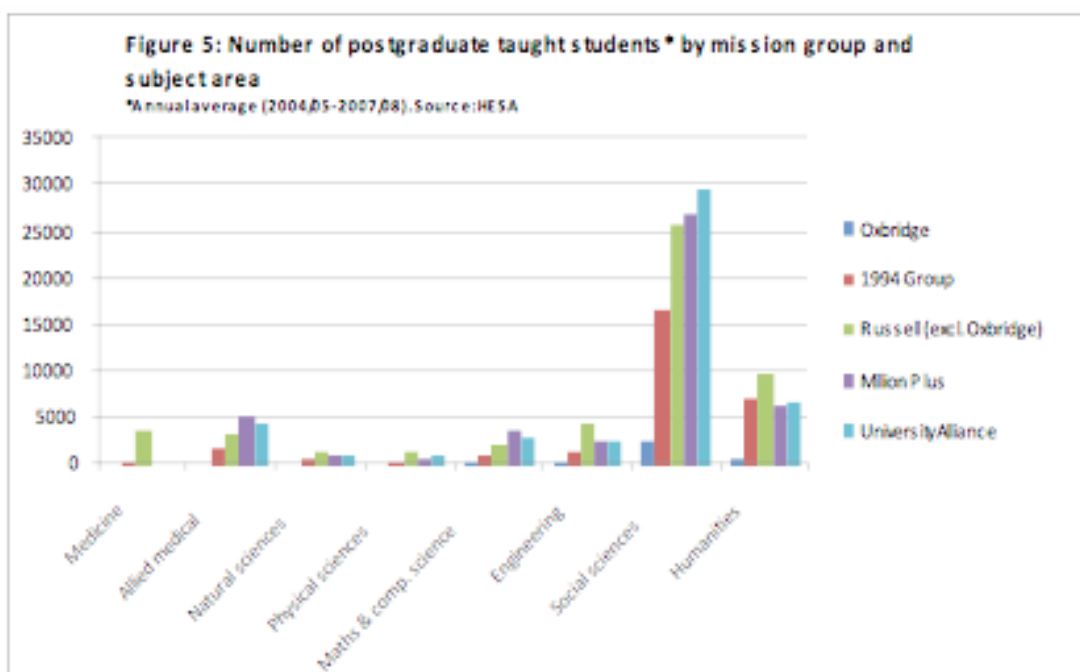
Postgraduate Research and Postgraduate Taught volume by subject area

3.2 Figure 4 shows the number of research students at each mission group across these different subject areas.



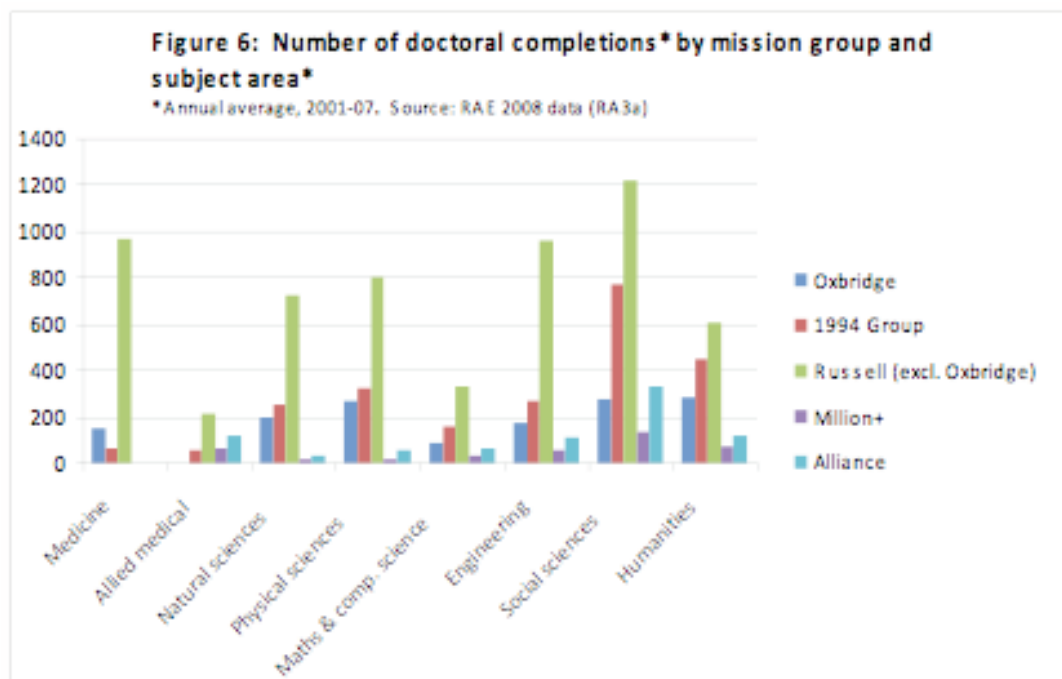
3.3 It is clear from Figure 4 that the 1994 and Russell Groups show significantly the greatest volume of PGR students, in comparison to the other two mission groups. This is the case across the different subject areas (with the exception of subjects allied to medicine), and is particularly marked natural and physical sciences, engineering, social sciences and humanities, along with the Russell Group's particularly high volume in clinical medicine. Oxbridge show notably high volume across the subject areas (with the exception of subjects allied to medicine), considering they are only two universities.

3.4 While it is clear that the majority of PGR provision across the different subject areas happens at research-intensive institutions, PGT provision is spread much more evenly across the sector, as is shown in Figure 5, below.



3.5 There are considerable numbers of PGT students at University Alliance and Million Plus institutions across each of the subject areas, with the exception of clinical medicine. The generally smaller-scale institutions of the 1994 Group have relatively fewer PGT students in comparison to the larger institutions in the non-research-intensive part of the sector. Therefore, it seems PGT provision is more reflective of the overall size of institutions, rather than their research-intensity. However, Oxbridge show far smaller relative numbers of PGT students (particularly in comparison to their relatively high numbers of PGR shown in Figure 4), which reflects the different way in which masters qualifications are provided in these universities.

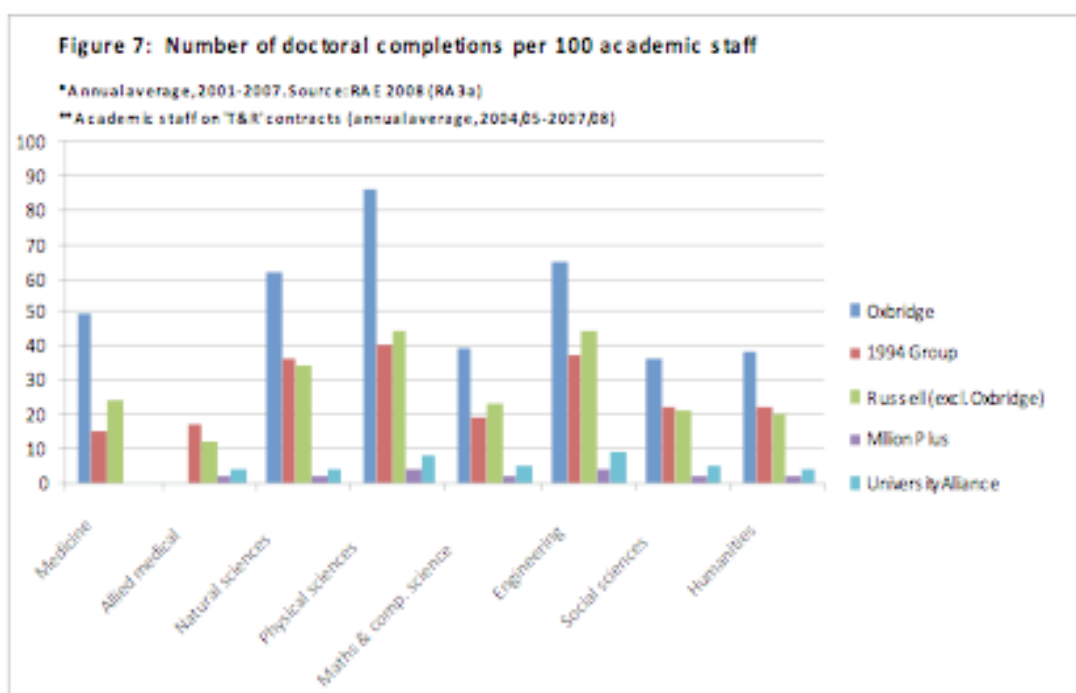
3.6 In terms of volume of doctoral completions, Figure 6 shows how this spreads across the subject areas for each mission group.



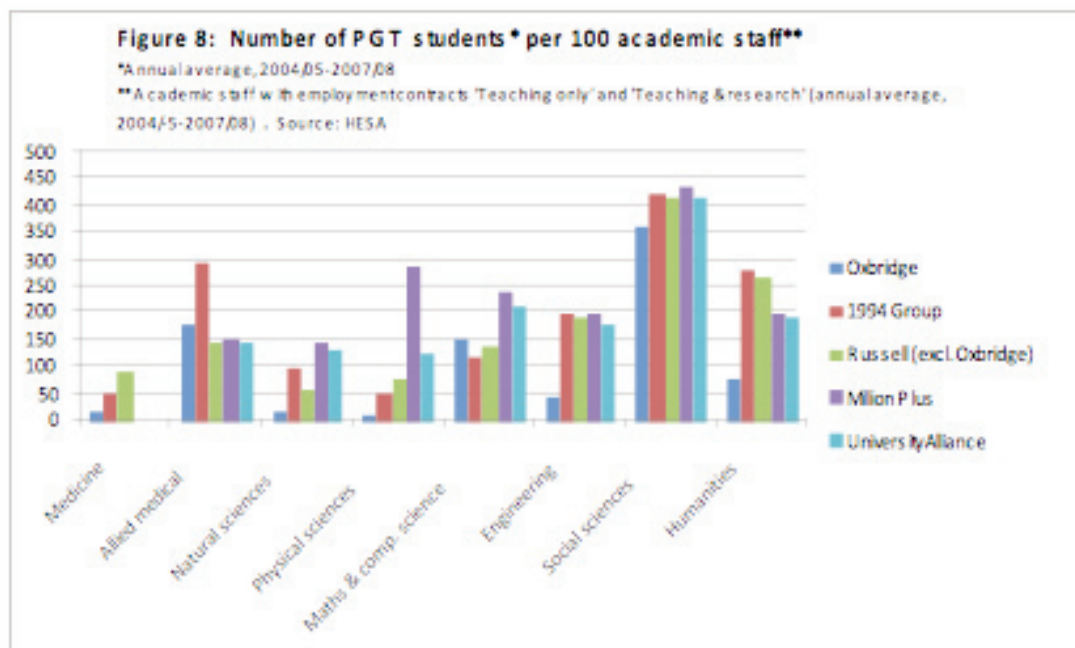
3.7 As this chart demonstrates, doctoral completions are much more prevalent at research-intensive institutions in all of the subject areas (with the exception of allied medical professions). The difference in volume between the 1994 and Russell Groups reflects the different overall scale of institutions in the two groups. Oxbridge shows a very high number of doctoral completions, reflecting the high number of research students at these universities.

Postgraduate Research and Postgraduate taught productivity by subject area

3.8 In the previous section we investigated how effective individual universities are in producing postgraduates, by using a 'productivity' indicator. This measure is used below to demonstrate the productivity of each university mission group across the eight subject areas.



- 3.9 Firstly, Figure 7 shows how our main 'productivity' indicator used in Figures 1 to 3 spreads across the different subject groupings for each university group.
- 3.10 Oxbridge show an extremely high productivity across the subject areas. The productivity is very similar between the 1994 Group and the rest of the Russell Group, and particularly high for both groups in engineering, natural sciences and physical sciences. It is clear that, across each subject area, the research-intensive mission groups are much more productive than the other two mission groups.
- 3.11 It seems there are three levels of the market in PhD provision. Oxford and Cambridge have an extremely strong and unique profile. The institutions of the 1994 Group and the rest of the Russell Group are very strong and productive. Non-research intensive universities of the other mission groups show far less productivity and volume of PhDs.
- 3.12 This landscape of PhD provision suggests that, if the Government wants the money it provides to PhD provision to be as effective as possible and achieve the best value, HEFCE's funding should be more concentrated than it currently is. Putting in place an appropriate quality threshold would ensure that the highest quality provision would be funded by the public purse (in addition to fee income). This would still allow all institutions to provide PhDs if they wish, but provision below the quality threshold would be reliant on the fee income rather than Government money.
- 3.13 While having a higher number of students per academic may seem undesirable in some discussions of university education, we do not believe this applies to postgraduate research students, which are more deeply involved in the research activity of the university, and by their nature require guidance and co-working rather than a large amount of supervision. As consistently evidenced by the Postgraduate Research Experience Survey (PRES), research students show a high level of satisfaction with their experiences. Overall, the PRES findings show that research students have generally very positive views about their experiences. In the most recent survey, four out of five rated their experience as having met or exceeded expectations, and the proportion has increased slightly each year.²
- 3.14 Finally, we examine how many PGT students there are compared to the number of staff most likely to be working with these students (those with 'teaching only' or 'teaching and research' in their employment contracts). Figure 8 examines this across the different subject areas.



- 3.15 This chart shows rather different outcomes to that showing the doctoral completions per 100 staff. Certain subject groups show similar numbers of PGT students per 100 staff across the sector, whilst there are instances of particular mission groups showing high numbers in comparison to each of the other mission groups. There is certainly not the clear divide between the research-intensive part of the sector and the non-research-intensive in terms of PGT per staff member.
- 3.16 It is clear that the PGT marketplace is very different from the PhD marketplace. As we can see it is spread, in a similar way to under graduate provision, across all types of university. Therefore, there is no question that PGT provision should be supported at all universities, and this re confirms how important it is that PGT has been included in the terms of reference for the Review of HE Funding & Student Finance.
- 3.17 A big issue for PGT is widening participation, and whether there are barriers to entry at this level, which is become an increasingly important level in a competitive employment market. This is one area in which the Postgraduate Review should focus its attention in terms of PGT.

² 'The Research Student Experience: Lessons from PRES', Higher Education Academy, Nov 09
<http://www.heacademy.ac.uk/assets/York/documents/ourwork/postgraduate/PRES2009Exec.pdf>

4. Conclusions

4.1 The conclusions emerging from this analysis are as follows:

- (i) It is the research-intensive institutions of the 1994 and Russell Groups that show the greatest productivity of PhDs, in terms of their completion rates and the relationship between completions and number of academic staff. Our ranked order of productivity rates shows that there is a large drop in productivity between research-intensive universities and the rest of the sector. After Oxbridge, the productivity of the 1994 and Russell Groups in each subject area are very similar, and are particularly high in engineering, physical sciences and natural sciences.
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Tom Norton, Director of Internal Policy Development
On behalf of the 1994 Group's Research & Enterprise Policy Group

Appendix A: Alignment on RAE panels with HESA cost centres

Subject Grouping	RAE Panel (2008)	HESA Cost Centre
Medicine	A-B	1. Clinical Medicine
Allied medical professions	C	2. Clinical Dentistry
		5. Nursing & Paramedical Studies
		6. Health & Community studies
		8. Pharmacy & Pharmacology
Natural Sciences	D	3. Veterinary Science
		4. Anatomy & physiology
		10. Bioscience
		13. Agriculture & forestry
Physical Sciences	E	11. Chemistry
		12. Physics
		14. Earth, marine & environmental science
Maths & Computer Science	F	24. Mathematics
		25. IT & systems science & computer software engineering
Engineering	G	16. General engineering
		17. Chemical engineering
		18. Mineral, metallurgy & materials engineering
		19. Civil engineering
		20. Electrical, electronic & computer engineering
		21. Mechanical, aero & production engineering
Social Sciences	H-K	7. Psychology & Behavioural Science
		23. Architecture, built environment & planning
		26. Catering & Hospitality Management
		27. Business & Managerial Studies
		28. Geography
		29. Social Studies
		34. Education
		37. Archaeology
		38. Sports Science & Leisure Studies
Humanities	L-O	30. Media Studies
		31. Humanities & Language Based studies
		33. Design & Creative Arts
		35. Modern Languages



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